IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A magnetic recording medium including at least a magnetic layer on a substrate, wherein:

the magnetic recording medium comprises, between said substrate and said magnetic layer, an under layer and/or a seed layer, and a crystal particle diameter control layer for controlling a crystal particle diameter and a particle diameter distribution of the magnetic layer, and the crystal particle diameter control layer comprises an alloy containing chromium (Cr) and carbon (C) and contains carbon (C) in a range of 0.01 at% to 0.5 at%.

2. (Canceled)

3. (Previously presented) The magnetic recording medium according to claim 1 wherein said crystal particle diameter control layer comprises an alloy further containing manganese (Mn).

4. (Original) The magnetic recording medium according to claim 3 wherein said crystal particle diameter control layer contains manganese (Mn) in a range of 0.5 at% to 5 at%.

5. (Currently Amended) The magnetic recording medium according to claim 1 wherein said crystal particle diameter control layer further contains at least one element selected from a group consisting of ~~molybdenum (Mo),~~ vanadium (V), tungsten (W), zirconium (Zr), ~~titanium (Ti),~~ tantalum (Ta), nickel (Ni), niobium (Nb), oxygen (O) and nitrogen (N).

6. (Original) The magnetic recording medium according to claim 5 wherein the content of said element or the total of said elements is in a range of 2 at% to 30 at%.

7. (Previously presented) A magnetic recording medium including two or more magnetic layers on a substrate, and including a nonmagnetic layer between at least one pair of said magnetic layers, wherein:

said nonmagnetic layer comprises the crystal particle diameter control layer of claim 1.

8. (Canceled)

9. (Previously presented) The magnetic recording medium according to claim 7 wherein the film thickness of said nonmagnetic layer is in a range of 5 to 100 angstroms.

10. (Previously presented) The magnetic recording medium according to claim 7 wherein for said magnetic layer, the saturation magnetic flux density Bs of the substrate-side magnetic layer is larger than the saturation magnetic flux density Bs of the medium surface-side magnetic layer.

11. (Original) A magnetic recording medium formed by successively laminating at least an under layer and a magnetic layer on a substrate, wherein:

said under layer comprises at least a seed layer for finely dividing crystal particles of the magnetic layer, the seed layer comprises at least two or more layers of nonmagnetic films, and an

intermediate layer formed of a material different from the material of said nonmagnetic film is interposed between the nonmagnetic films.

12. (Previously presented) The magnetic recording medium according to claim 11 wherein an under film for adjusting the crystal orientation of the magnetic layer is formed between said seed layer and said magnetic layer.

13. (Previously presented) The magnetic recording medium according to claim 11 wherein the film thickness of said nonmagnetic film is in a range of 100 to 550 angstroms.

14. (Previously presented) The magnetic recording medium according to claim 11 wherein the film thickness of said intermediate layer is in a range of 5 to 50 angstroms.

15. (Previously presented) The magnetic recording medium according to claim 11 wherein said intermediate layer comprises a nonmagnetic material which includes the same crystal structure as that of said nonmagnetic film.

16. (Previously presented) The magnetic recording medium according to claim 15 wherein said intermediate layer comprises a material in which a crystal lattice surface interval does not match with that of said nonmagnetic film.

17. (Previously presented) The magnetic recording medium according to claim 16 wherein said nonmagnetic film comprises a material containing one alloy selected from a group consisting of

NiAl, AlCo, FeAl, FeTi, CoFe, CoTi, CoHf, CoZr, NiTi, CuZn, AlMn, AlRe, AgMg, CuSi, NiGa, CuBe, MnV, NiZn, FeV, CrTi, CrNi, NiAlRu, NiAlW, NiAlTa, NiAlHf, NiAlMo, NiAlCr, NiAlZr, NiAlNb, and Al_2FeMn_2, and said intermediate layer comprises a material containing Cr.

18. (Currently amended) The magnetic recording medium according to claim 17 wherein said intermediate layer comprises a material formed of Cr and at least one [[type]] element selected from a group consisting of Mo, V, W, and Ta.

19. (Previously presented) The magnetic recording medium according to claim 18 wherein said intermediate layer comprises an alloy mainly containing Cr and W.

20. (Original) A thermal stability measuring method of a magnetic recording medium, the method comprising the steps of:

disposing the magnetic recording medium constituted by forming at least a magnetic layer on a substrate, and a magnetic head comprising a read/write element provided with a read element and a write element fixed to one end of a head support member on the main surface of the magnetic recording medium under an atmosphere heated to a predetermined temperature;

relatively moving said magnetic head with respect to said main surface, and writing a signal to a predetermined track position on said magnetic layer by said write element; and

detecting the write signal written to said track by said read element, and comparing said write signal with said detected signal to calculate the signal attenuation of the magnetic recording medium to measure the thermal stability of the magnetic recording medium, wherein:

the write track width of said write element is set to be larger than the total of the track width of a radial direction of said track position on said magnetic layer, and the movement amount of said track position in the radial direction by thermal expansion caused by heating said head support member.

21. (Original) A thermal stability measuring method of a magnetic recording medium, the method comprising the steps of:

preparing the magnetic recording medium constituted by forming at least a magnetic layer on a substrate;

rotating said magnetic recording medium to dispose a magnetic head on the main surface of the magnetic recording medium, the magnetic head comprising a read/write element which is opposite to the main surface of the magnetic recording medium and whose write track width is twice or more as large as a read track width, and relatively moving said magnetic head on said main surface with respect to said main surface;

disposing said magnetic recording medium and said magnetic head under an atmosphere heated to a predetermined temperature;

writing a signal to the magnetic layer of said magnetic recording medium by the read/write element of said magnetic head;

detecting the write signal written to said magnetic layer by the read/write element of the magnetic head; and

comparing said write signal with said detected signal to calculate the signal attenuation of the magnetic recording medium.

22. (Original) A thermal stability measuring method of a magnetic recording medium, the method comprising the steps of:

preparing a magnetic recording medium constituted by forming at least a magnetic layer on a substrate;

rotating said magnetic recording medium to dispose/fix a magnetic head on the main surface of the magnetic recording medium, the magnetic head comprising a read/write element which is opposite to the main surface of the magnetic recording medium and whose write track width is twice or more as large as a read track width, and relatively moving said magnetic head on said main surface with respect to said main surface;

disposing said magnetic recording medium and said magnetic head under an atmosphere heated to a predetermined temperature;

writing a signal to the magnetic layer of said magnetic recording medium by the read/write element of said magnetic head;

detecting the write signal written to said magnetic layer by the read/write element of the magnetic head; and

comparing said write signal with said detected signal to calculate the signal attenuation of the magnetic recording medium.

23. (Original) A thermal stability measuring apparatus of a magnetic recording medium, the apparatus comprising:

a head/disc mechanism section provided with a mechanism for rotating a magnetic disk, and a magnetic head comprising a read/write element whose write track width is twice or more as large as a read track width;

a read/write circuit section having a function of performing writing and reading of a signal with respect to said magnetic disk;

a signal evaluating section having a function of measuring and evaluating a read signal of the magnetic disk read from said read/write element; and

an environmental tank containing at least said head/disk mechanism section and being controllable in temperature.

24. (Previously presented) The thermal stability measuring apparatus of the magnetic recording medium according to claim 23 wherein said head/disk mechanism section comprises a mechanism for fixing the magnetic head to a predetermined position above the main surface of the magnetic disk.

25. (Original) A thermal stability measuring apparatus of a magnetic recording medium, the apparatus comprising:

a head/disc mechanism section provided with a mechanism for rotating a magnetic disk, and a head comprising a read/write element including a read element and a write element disposed opposite to the main surface of said magnetic disk and on one end of a head support member;

a read/write circuit section having a function of performing writing and reading of a signal with respect to said magnetic disk;

a signal evaluating section having a function of measuring and evaluating a read signal of the magnetic disk read from said read/write element; and

an environmental tank containing at least said head/disk mechanism section and being controllable in temperature, wherein:

the write track width of said write element is larger than the total of the track width of a radial direction of the track position of said magnetic disk, and the movement amount of said track position in the radial direction by thermal expansion caused by heating said head support member.

26-28 (Canceled)

29. (Previously presented) The magnetic recording medium of claim 3 wherein said crystal particle diameter control layer further contains at least one element selected from a group consisting of molybdenum (Mo), vanadium (V), tungsten (W), zirconium (Zr), titanium (Ti), tantalum (Ta), nickel (Ni), niobium (Nb), oxygen (O), and nitrogen (N).

30. (Canceled)

31. (Previously presented) The magnetic recording medium of claim 4 wherein said crystal particle diameter control layer further contains at least one element selected from a group consisting of molybdenum (Mo), vanadium (V), tungsten (W), zirconium (Zr), titanium (Ti), tantalum (Ta), nickel (Ni), niobium (Nb), oxygen (O), and nitrogen (N).

32-33 (Canceled)

34. (Previously presented) The magnetic recording medium according to claim 29 wherein the content of said element or the total of said elements is in a range of 2 at% to 30 at%.

35. (Canceled)

36. (Previously presented) The magnetic recording medium according to claim 31 wherein the content of said element or the total of said elements is in a range of 2 at% to 30 at%.

37-38 (Canceled)

39. (Previously presented) A magnetic recording medium including two or more magnetic layers on a substrate, and including a nonmagnetic layer between at least one pair of said magnetic layers, wherein:

said nonmagnetic layer comprises the crystal particle diameter control layer of claim 3.

40. (Canceled)

41. (Previously presented) A magnetic recording medium including two or more magnetic layers on a substrate, and including a nonmagnetic layer between at least one pair of said magnetic layers, wherein:

said nonmagnetic layer comprises the crystal particle diameter control layer of claim 4.

42. (Canceled)

43. (Previously presented) A magnetic recording medium including two or more magnetic layers on a substrate, and including a nonmagnetic layer between at least one pair of said magnetic layers, wherein:

said nonmagnetic layer comprises the crystal particle diameter control layer of claim 5.

44. (Canceled)

45. (Previously presented) A magnetic recording medium including two or more magnetic layers on a substrate, and including a nonmagnetic layer between at least one pair of said magnetic layers, wherein:

said nonmagnetic layer comprises the crystal particle diameter control layer of claim 29.

46. (Canceled)

47. (Previously presented) A magnetic recording medium including two or more magnetic layers on a substrate, and including a nonmagnetic layer between at least one pair of said magnetic layers, wherein:

said nonmagnetic layer comprises the crystal particle diameter control layer of claim 31.

48. (Canceled)

49. (Previously presented) A magnetic recording medium including two or more magnetic layers on a substrate, and including a nonmagnetic layer between at least one pair of said magnetic layers, wherein:

said nonmagnetic layer comprises the crystal particle diameter control layer of claim 6.

50. (Canceled)

51. (Previously presented) A magnetic recording medium including two or more magnetic layers on a substrate, and including a nonmagnetic layer between at least one pair of said magnetic layers, wherein:

said nonmagnetic layer comprises the crystal particle diameter control layer of claim 34.

52. (Canceled)

53. (Previously presented) A magnetic recording medium including two or more magnetic layers on a substrate, and including a nonmagnetic layer between at least one pair of said magnetic layers, wherein:

said nonmagnetic layer comprises the crystal particle diameter control layer of claim 36.

54-55 (Canceled)

56. (Previously presented) The magnetic recording medium according to claim 39 wherein the film thickness of said nonmagnetic layer is in a range of 5 to 100 angstroms.

57. (Canceled)

58. (Previously presented) The magnetic recording medium according to claim 41 wherein the film thickness of said nonmagnetic layer is in a range of 5 to 100 angstroms.

59. (Canceled)

60. (Previously presented) The magnetic recording medium according to claim 43 wherein the film thickness of said nonmagnetic layer is in a range of 5 to 100 angstroms.

61. (Canceled)

62. (Previously presented) The magnetic recording medium according to claim 45 wherein the film thickness of said nonmagnetic layer is in a range of 5 to 100 angstroms.

63. (Canceled)

64. (Previously presented) The magnetic recording medium according to claim 47 wherein the film thickness of said nonmagnetic layer is in a range of 5 to 100 angstroms.

65. (Canceled)

66. (Previously presented) The magnetic recording medium according to claim 49 wherein the film thickness of said nonmagnetic layer is in a range of 5 to 100 angstroms.

67. (Canceled)

68. (Previously presented) The magnetic recording medium according to claim 51 wherein the film thickness of said nonmagnetic layer is in a range of 5 to 100 angstroms.

69. (Canceled)

70. (Previously presented) The magnetic recording medium according to claim 53 wherein the film thickness of said nonmagnetic layer is in a range of 5 to 100 angstroms.

71-73 (Canceled)

74. (Previously presented) The magnetic recording medium according to claim 12 wherein the film thickness of said nonmagnetic film is in a range of 100 to 550 angstroms.

75. (Previously presented) The magnetic recording medium according to claim 12 wherein the film thickness of said intermediate layer is in a range of 5 to 50 angstroms.

76. (Previously presented) The magnetic recording medium according to claim 13 wherein the film thickness of said intermediate layer is in a range of 5 to 50 angstroms.

77. (Previously presented) The magnetic recording medium according to claim 74 wherein the film thickness of said intermediate layer is in a range of 5 to 50 angstroms.

78. (Previously presented) The magnetic recording medium according to claim 74 wherein said intermediate layer comprises a nonmagnetic material which includes the same crystal structure as that of said nonmagnetic film.

79. (Previously presented) The magnetic recording medium according to claim 78 wherein said intermediate layer comprises a material in which a crystal lattice surface interval doe not match with that of said nonmagnetic film.